

## FORAGE SUITABILITY GROUP

### Overflow

**FSG No.:** G055CY500SD

**Major Land Resource Area:** 55C - Southern Black Glaciated Plains

#### Physiographic Features

The soils in this group are generally found in nearly level to gently sloping positions on stream terraces, fan remnants, and flood plains, and in swales and drainage ways on uplands. They receive beneficial additional moisture as run-on from up slope, or from flooding.

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	1300	1970
<b>Slope (percent):</b>	0	3
<b>Flooding:</b>		
<b>Frequency:</b>	None	Frequent
<b>Duration:</b>	None	Brief
<b>Ponding:</b>		
<b>Depth (inches):</b>		
<b>Frequency:</b>	None	None
<b>Duration:</b>	None	None
<b>Runoff Class:</b>	Negligible	Medium

#### Climatic Features

This group occurs in a mid-continental climate characterized by wide seasonal temperature and precipitation fluctuations and extremes.

Annual precipitation varies widely from year to year in MLRA 55C. Average annual precipitation for all climate stations listed below is about 21 inches. About 75 percent of that occurs during the months of April through September. On average, there are about 28 days with greater than .1 inches of precipitation during the same timeframe. Annual precipitation and temperature increase from the north to the south in the MLRA. Precipitation is less than needed for optimum forage production and is the single largest factor limiting production from this group on non-irrigated lands.

Average annual snowfall ranges from 23 inches at Pickstown to 41 inches at Huron. Snow cover at depths greater than 1 inch range from 32 days at Howard to 72 days at Huron.

Average July temperatures are about 75°F and average January temperatures are about 16°F. Recorded temperature extremes in the MLRA during the years 1961 to 1990 are a low of -39 at both Mellette and Huron, and a high of 114 recorded at Mellette. The MLRA lies mostly in USDA Plant Hardiness Zones 4a and 4b, with a small area of warmer 5a along the Missouri River.

At Huron, the average annual wind speeds are about 11.5 mph. The highest wind speeds occur during March through May. It is cloudy about 154 days a year. Average morning relative humidity in June is about 86 percent and average afternoon humidity is 59 percent.

The climate data listed in the tables below represent high and low ranges and averages for the climate stations and dates listed. For additional climate data, access the National Water and Climate Center at <http://www.wcc.nrcs.usda.gov>.

	<b>From</b>	<b>To</b>
<b>Freeze-free period (28 deg)(days):</b> (9 years in 10 at least)	128	161
<b>Last Killing Freeze in Spring (28 deg):</b>	May 19	May 07
<b>Last Frost in Spring (32 deg):</b> (1 year in 10 later than)	May 31	May 18
<b>First Frost in Fall (32 deg):</b> (1 year in 10 earlier than)	Sep 08	Sep 23
<b>First Killing Freeze in Fall (28 deg):</b> (1 year in 10 earlier than)	Sep 16	Oct 04
<b>Length of Growing Season (32 deg)(days):</b> (9 years in 10 at least)	105	136
<b>Growing Degree Days (40 deg):</b>	4360	5304
<b>Growing Degree Days (50 deg):</b>	2763	3192
<b>Annual Minimum Temperature:</b>	-30	-20
<b>Mean annual precipitation (inches):</b>	18	22

### Monthly precipitation (inches) and temperature (F)

<b>2 years in 10:</b>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>
Precip. Less Than	0.12	0.18	0.36	0.85	1.28	1.35	1.40	0.94	0.52	0.43	0.18	0.20
Precip. More Than	0.93	1.28	2.56	3.74	5.15	5.28	4.68	3.53	4.20	2.68	1.90	1.38
<b>Monthly Average:</b>	0.44	0.61	1.48	2.32	3.11	3.56	2.72	2.27	2.10	1.47	0.80	0.56
<b>Temp. Min.</b>	-1.5	4.9	18.8	31.6	43.3	53.4	58.8	55.4	44.1	32.5	18.7	4.1
<b>Temp. Max.</b>	30.6	36.4	47.0	62.4	73.4	83.0	90.4	88.6	78.2	65.5	46.7	33.4
<b>Temp. Avg.</b>	15.8	21.8	33.4	47.8	59.3	69.0	75.2	72.9	62.3	50.2	33.9	17.7

<u>Climate Station</u>	<u>Location</u>	<u>From</u>	<u>To</u>
SD0043	Academy, SD	1961	1990
SD4037	Howard, SD	1961	1990
SD4127	Huron, SD	1961	1990
SD5456	Mellette, SD	1961	1990
SD5561	Miller, SD	1961	1990
SD6574	Pickstown, SD	1961	1990
SD7052	Redfield, SD	1961	1990
SD8767	Wagner, SD	1961	1990

### Soil Interpretations

This group consists of very deep, mostly moderately well-drained, medium to moderately fine textured soils formed from glacial till and silty and loamy sediments and alluvium. Permeability is moderately slow to moderate. Many of these soils have a seasonal water table within three feet of the surface which benefits deep-rooted plants.

<b>Drainage Class:</b>	Moderately well-drained	To	Well-drained
<b>Permeability Class:</b> (0 - 40 inches)	Moderately slow	To	Moderate
<b>Frost Action Class:</b>	Moderate	To	High

	<u>Minimum</u>	<u>Maximum</u>
<b>Depth:</b>	72	
<b>Surface Fragments &gt;3" (% Cover):</b>	0	3
<b>Organic Matter (percent):</b> (surface layer)	2.0	6.0
<b>Electrical Conductivity (mmhos/cm):</b> (0 - 24 inches)	0	4

	<u>Minimum</u>	<u>Maximum</u>
<b>Sodium Absorption Ratio:</b> (0 - 12 inches)	0	0
<b>Soil Reaction (1:1) Water (pH):</b> (0 - 12 inches)	5.6	8.4
<b>Available Water Capacity (inches):</b> (0 - 60 inches)	9	
<b>Calcium Carbonate Equivalent (percent):</b> (0 - 12 inches)	0	10

### Adapted Species List

The following forage species are considered adapted to grow on the soils in this group. Additional information concerning plant characteristics of a number of the listed species as well as individual cultivars of many of those species can be accessed at <http://plants.usda.gov/>.

#### Cool Season Grasses

Altai wildrye	F
Canada wildrye	G
Creeping foxtail	F
Crested wheatgrass	G
Green needlegrass	G
Intermediate wheatgrass	G
Meadow brome	G
Newhy hybrid wheatgrass	G
Pubescent wheatgrass	G
Reed canarygrass	F
Russian wildrye	G
Slender wheatgrass	G
Smooth brome	G
Tall wheatgrass	G
Western wheatgrass	G

#### Warm Season Grasses

Big bluestem	G
Indiangrass	G
Little bluestem	G
Sand bluestem	F
Sideoats grama	G
Switchgrass	G

#### Legumes

Alfalfa	G
Birdsfoot trefoil	G
Canada milkvetch	G
Cicer milkvetch	G
Purple prairieclover	F
Red clover	G
Sainfoin	F
Sweetclover	G
White prairieclover	F

G - Good adaptation for forage production on this group of soils in this MLRA

F - Fair adaptation but will not produce at its highest potential

### Production Estimates

Production estimates listed here should only be used for making general management recommendations. Onsite production information should always be used for making detailed planning and management recommendations.

The high forage production estimates listed below are based on dense, vigorous stands of climatically adapted, superior performing cultivars. They are properly fertilized for high yields and pest infestations are kept below economic thresholds. Mechanical harvests are managed to maintain stand life by cutting at appropriate stages of maturity and harvest intervals. If grazed, optimum beginning and ending grazing heights are adhered to. Adequate time is allowed for plant recovery before entering winter dormancy under both uses.

The production estimates listed below represent total annual above ground plant production on an air-dry-matter basis. Estimates of hay and grazing yields can be calculated from these numbers by multiplying them by a harvest efficiency. A 70 percent harvest efficiency is commonly used when converting to hay yields. Pasture harvest efficiency is highly dependent on the grazing management system applied, ranging from 25 to 50 percent.

**Forage Crop****Management Intensity**

	<b><u>High</u></b> <b>(lbs/ac)</b>	<b><u>Low</u></b> <b>(lbs/ac)</b>
Alfalfa	10900	5400
Alfalfa/Intermediate wheatgrass	8300	4000
Alfalfa/Smooth brome grass	8300	4000
Big bluestem	7400	3700
Indiangrass	6000	3100
Intermediate wheatgrass	6300	3100
Smooth brome grass	6300	3100
Switchgrass	8000	4000

**Forage Growth Curves**

Growth curves estimate the seasonal distribution of growth of the various forage crops. They indicate when the forages may be available for grazing or mechanical harvest.

**Growth Curve Number:** SD0001  
**Growth Curve Name:** Alfalfa  
**Growth Curve Description:** Alfalfa, MLRAs 107, 102B, 63B, 66, 65

**Percent Production by Month**

<b><u>Jan</u></b>	<b><u>Feb</u></b>	<b><u>Mar</u></b>	<b><u>Apr</u></b>	<b><u>May</u></b>	<b><u>Jun</u></b>	<b><u>Jul</u></b>	<b><u>Aug</u></b>	<b><u>Sep</u></b>	<b><u>Oct</u></b>	<b><u>Nov</u></b>	<b><u>Dec</u></b>
0	0	0	5	30	25	20	15	5	0	0	0

**Growth Curve Number:** SD0004  
**Growth Curve Name:** Cool season grass  
**Growth Curve Description:** Cool season grass, statewide

**Percent Production by Month**

<b><u>Jan</u></b>	<b><u>Feb</u></b>	<b><u>Mar</u></b>	<b><u>Apr</u></b>	<b><u>May</u></b>	<b><u>Jun</u></b>	<b><u>Jul</u></b>	<b><u>Aug</u></b>	<b><u>Sep</u></b>	<b><u>Oct</u></b>	<b><u>Nov</u></b>	<b><u>Dec</u></b>
0	0	0	10	40	30	10	5	5	0	0	0

**Growth Curve Number:** SD0005  
**Growth Curve Name:** Warm season grass  
**Growth Curve Description:** Warm season grass, statewide

**Percent Production by Month**

<b><u>Jan</u></b>	<b><u>Feb</u></b>	<b><u>Mar</u></b>	<b><u>Apr</u></b>	<b><u>May</u></b>	<b><u>Jun</u></b>	<b><u>Jul</u></b>	<b><u>Aug</u></b>	<b><u>Sep</u></b>	<b><u>Oct</u></b>	<b><u>Nov</u></b>	<b><u>Dec</u></b>
0	0	0	0	10	40	35	15	0	0	0	0

**Soil Limitations**

These soils have few limitations to the production of climatically adapted forage crops. Production potential is high. Flooding is a potential hazard to some of these soils. Also, all of these soils receive additional moisture, so the potential exists for soil compaction from grazing or operating machinery on them when wet.

**Management Interpretations**

Soils in this group that are subject to flooding can have forage production adversely impacted if it occurs during the spring or growing season. Flooding duration, or the time period plants are under water, is more important than flooding frequency for the survival of forage crops. If these soils flood it is generally for only a brief time. Exclude livestock and machinery during extended periods of soil wetness to reduce soil compaction. When establishing new stands or renovating stands, selective highly productive species and varieties that can make best use of the additional soil moisture this group receives.

**FSG Documentation****Similar FSGs:**

<b>FSG ID</b>	<b>FSG Narrative</b>
G055CY100S	Loamy soils do not receive the additional water and are less productive.
G055CY700S	Subirrigated soils have elevated water tables between 18-48 of the surface during part of the growing season.

### **Inventory Data References:**

Agriculture Handbook 296-Land Resource Regions and Major Land Resource Areas  
Natural Resources Conservation Service (NRCS) National Water and Climate Center data  
USDA Plant Hardiness Zone maps  
National Soil Survey Information System (NASIS) for soil surveys in South Dakota counties in MLRA 55C  
NRCS South Dakota Technical Guide  
NRCS National Range and Pasture Handbook  
Various Agricultural Research Service, Cooperative Extension Service, and NRCS research trials for plant adaptation and production.

### **State Correlation**

This site has been correlated with the following states: South Dakota

### **Forage Suitability Group Approval**

**Original Author:** Tim Nordquist  
**Original Date:** 2/7/02  
**Approval by:** Dave Schmidt  
**Approval Date:** 10/29/02